Cladograms – Questions about the cladogram examples

Cladogram 1 – Simple vertical cladogram

1. How many species shown have a "lizard like face"?

   ……Two.

2. How many species have an exoskeleton?

   ……Three …….

Cladogram 2 - Cladogram of Theropod dinosaurs

If you use the beginning of the classification names on the diagram they are similar to the English names.

1. Did the Allosaurus group diverge before or after the tyrannosaurs?

   ……Before – as the branch is closer to the bottom left corner ….

2. Are the Oviraptors more closely related to the birds than the Tyranosaurus? How can you tell?

   Yes the oviraptors are more closely related to the birds.

   We can tell this because the branch of the oviroaptors is close to the birds than the tyrannosaurus branch

Cladogram 3 - A cladogram of extinct Crocodiles

It is quite hard to see the diagrams which show the shape of the head.

1. It could be said that this diagram represents a single clade. Explain why?

   A clade is a classification group composed of all the descendants of a single ancestor species.

   As the diagram begins with a single line on the left it suggests a single ancestor species. So the whole diagram could represent a clade.

   (There are obviously also two divisions within this clade – green and blue)

2. Which two species diverged most recently – according to the diagram? Explain how you know.

……The two species "J" and "k" have diverged most recently

……we can see this because the vertical line between them is closest to the right of the diagram. Time goes from left to right in the diagram.

Cladogram 4 - Three alternative cladograms of butterfly families

1. A clade shows the last common ancestor and all the descendant branches. Which of the boxes 1,2 or 3 Does not show a clade? Explain why.

… Box 3 does not show a clade, because it is missing one of the descendants, *Hedylidacae*, of the common ancestor which should be part of that clade.

2. Why are there different interpretations of the data used to make a cladogram?

…Often common ancestors are fossil species, which became extinct many years ago. Evidence comes from external features as well as DNA comparisons and there are sometimes different interpretations of the data possible. Sometimes new evidence (often from DNA analysis) will falsify previous classifications made using external features.

Cladogram 5 & 6 – Other types of cladogram

Cladograms can be made using physical features but often other data is used.

1. What two types of data are used to construct the last two cladograms?

The corresponding amino acid sequence of a protein (MAMDC1).or the base sequences of a gene (HP1 or Like HP1).